

WHAT IS CLAIMED IS:

1. A catheter, comprising:
 - a proximal shaft defining a guidewire lumen and an inflation lumen, wherein said inflation lumen is arcuate shaped and reinforced with a tube having an arcuate shaped cross-section;
 - a distal shaft wherein said distal shaft has a greater flexibility than said proximal shaft; and
 - a transition section having a proximal end and a distal end, said proximal end communicating with said proximal shaft and said distal end communicating with said distal shaft, wherein said transition section has a gradually increased flexibility from said proximal to said distal ends.
2. The catheter of claim 1, wherein said gradually increased flexibility is created by a spiral helix in the transition section.
3. The catheter of claim 2, wherein said spiral helix is positioned on an exterior surface of said transition section.
4. The catheter of claim 2, wherein said spiral helix is positioned against an interior surface of said transition section.
5. The catheter of claim 2, wherein said spiral helix is entirely embedded into an extruded thickness of said transition section.
6. The catheter of claim 2, wherein subsequent windings of said spiral helix are closer together at said proximal end of said transition section and farther apart at said distal end of said transition section.

7. The catheter of claim 2, wherein said spiral helix is made from one of a metal ribbon or metal wire.
8. The catheter of claim 2, wherein said spiral helix is made from a thermoplastic polymer.
9. The catheter of claim 1, wherein said tube includes a skived portion at its distal end that extends within said transition section to achieve said gradually increased flexibility.
10. The catheter of claim 1, wherein said proximal shaft has a longitudinal cut along its length, said longitudinal cut extending in a radial direction between an exterior surface of said proximal shaft and said guidewire lumen.
11. The catheter of claim 10, wherein said longitudinal cut extends distally into said transition section.
12. The catheter of claim 11, wherein said gradually increased flexibility is created by a U-shaped wire sleeve, said wire sleeve having an opening for generally aligning with said longitudinal cut.
13. The catheter of claim 12, wherein said sleeve is a wire formed into a zigzag shape and bent into a generally curved shape.
14. The catheter of claim 13, wherein said sleeve is positioned around an exterior surface of said transition section.
15. The catheter of claim 13, wherein said sleeve is embedded within an extruded thickness of said transition section.

16. The catheter of claim 1, wherein said tube is made from one of a metal and a thermoplastic polymer.
17. A catheter, comprising:
 - a proximal shaft defining a guidewire lumen and an inflation lumen, wherein said inflation lumen is arcuate shaped and reinforced with a reinforcing means;
 - a distal shaft wherein said distal shaft has a greater flexibility than said proximal shaft; and
 - a transition section having a proximal end and a distal end, said proximal end communicating with said proximal shaft and said distal end communicating with said distal shaft, wherein said transition section includes a transition means embedded entirely within an extruded thickness of said transition section.
18. The catheter of claim 17, wherein said reinforcing means is a metal tube having an arcuate cross-section.
19. The catheter of claim 17, wherein said reinforcing means is one of a metal rod, a long thin metal plate, a skived metal tube and a halved metal tube.
20. The catheter of claim 17, wherein said reinforcing means is entirely embedded within an extruded thickness of said proximal shaft.
21. The catheter of claim 17, wherein said reinforcing means is disposed within an interior surface of said proximal shaft defining said inflation lumen.
22. The catheter of claim 17, wherein said transition means is a spiral helix.

23. The catheter of claim 22, wherein said spiral helix has a tight pitch at a first end and a loose pitch at a second end.
24. The catheter of claim 17, wherein said transition means is a portion of said reinforcing means.
25. The catheter of claim 24, wherein said transition means is a skived portion of a tube.
26. The catheter of claim 24, wherein said transition means is a rod that becomes thinner and more flexible along a longitudinal length.
27. The catheter of claim 24, wherein said transition means is a metal plate that become thinner and more flexible along a longitudinal length.
28. The catheter of claim 17, wherein said transition means is a U-shaped wire sleeve.
29. The catheter of claim 28, wherein said U-shaped wire sleeve has a tight pitch at a first end and a loose pitch at a second end.
30. The catheter of claim 17, wherein said transition section is an extension of said distal shaft, such that said transition section is defined by the length of said transition means.
31. The catheter of claim 17, wherein said transition section is an extension of said proximal shaft after a point where said reinforcing means terminates, such that said transition section is defined from a point where said reinforcing means terminates to where said distal shaft begins.

32. The catheter of claim 17, wherein said proximal shaft further includes a longitudinal cut along the length thereof to facilitate the removal of a guidewire from said guidewire lumen.

33. The catheter of claim 32, wherein said longitudinal cut extends distally into said transition section.